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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,679	06/26/2003	Li-Peng Wang	42.P16640	8027

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EXAMINER

AGUIRRECHEA, JAYDI A

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/607,679

Applicant(s)

WANG, LI-PENG

Examiner

Jaydi A. Aguirrechea

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/21/06 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 6-7, 17-19 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Bradley et al. (EP-1217734).

Bradley discloses an apparatus comprising a film bulk acoustic resonator (FBAR) (50) comprising a piezoelectric membrane (60) having a portion thereof sandwiched between a first electrode (58) and a second electrode (62), the piezoelectric membrane being suspended from at least two edges thereof; and a heat transfer layer (76) placed on the piezoelectric membrane surrounding, but not in electrical contact with, the first electrode. As shown in figures 3 and 4, the metal layer 76 is placed on the piezoelectric layer and surrounds the electrode, but is not in physical or electrical contact with the first electrode.

Art Unit: 2834

With regards to claim 2, heat transfer layer has a high thermal conductivity relative to the piezoelectric membrane (made of the same material as the electrodes).

With regards to claim 3, the heat transfer layer extends from near the first electrode to the edges of the piezoelectric membrane (Figure 3).

With regards to claim 6, Bradley discloses the piezoelectric layer being aluminum nitride (column 4, line 52).

With regards to claim 7, the layer 76 is made from a metal.

4. With regards to claims 17-19, 22 and 23, the use of a signal source and a receiver to receive the signal generated by the signal source and passed through the FBAR is inherent in the disclosure of Bradley in combination with AAPA. Both, Bradley and AAPA disclose the resonators to be used in filters for electronic circuits, therefore, a signal source and a receiver must be provided to perform such functions.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 4-5 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley in view of AAPA.

Bradley discloses the claimed invention except for the piezoelectric membrane being suspended from its edges by a pair of supports, the supports having a high thermal conductivity relative to the piezoelectric membrane.

AAPA discloses the piezoelectric membrane being suspended from at least two edges and the supports having a high thermal conductivity relative to the piezoelectric membrane.

Art Unit: 2834

As disclosed in AAPA, the thermal energy is dissipated into the supports 114. Therefore, it would have been obvious at the time of the invention was made to suspended the piezoelectric layer from at least two supports and have the supports comprising a high thermal conductivity relative to the piezoelectric membrane in order to dissipate the heat and act as a heat sink in the device.

With regards to claims 5 and 21, the use of silicon as a substrate in a piezoelectric device is old and well known in the art. See for example, US Patents: 6384697, 6377137 and 6198208.

7. Claims 8 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley.

Bradley discloses the claimed invention as explained in item 3, but fails to disclose the metal comprising gold (Au) or aluminum (Al).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the electrodes from gold or aluminum and therefore the heat sink (76) since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Bradley discloses the heat sink made from the same material as the electrodes. Bradley also, discloses the use of molybdenum as the metal used in the electrodes and pointed out that other materials may also be used. Therefore, the use of gold or aluminum would be within the general skill of a worker in the art.

8. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley in view of AAPA.

Bradley discloses the claimed invention as disclosed in items 3-5, but fails to disclose the plurality of coupled FBARs on a piezoelectric membrane.

Art Unit: 2834

AAPA discloses the plurality of coupled FBARs on a piezoelectric membrane to be used as a filter used in wireless communications. The Applicant is advised that it has been held by the courts that mere duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Therefore, it would have been obvious at the time of the invention was made to have an array of FBARs to form a filter to be used in wireless communications.

Claims 10-11 and 14-15 are rejected based on the teachings of Bradley as explained in item 3.

Claims 12 and 13 are rejected based on the teachings of Bradley as explained in item 6.

Claim 16 is rejected based on the teachings of Bradley as explained in item 7.

Response to Arguments

9. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaydi A. Aguirrechea whose telephone number is 571-272-2018. The examiner can normally be reached on M-Th 9-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren E. Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JAA
3/4/06

